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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Ralph Edmund Harris

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23117 7590 04/05/2010  
NIXON & VANDERHYE, PC  
901 NORTH GLEBE ROAD, 11TH FLOOR  
ARLINGTON, VA 22203

EXAMINER

DITRANI, ANGELA M

ART UNIT

PAPER NUMBER

3676

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/594,568	<b>Applicant(s)</b> HARRIS ET AL.	
	<b>Examiner</b> Angela M. DiTrani	<b>Art Unit</b> 3676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 41-67 and 76-78 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 41-67, 76-78 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/23/09</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 41-58, 60-67, 76, and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harris et al. (WO 00/57022 – cited previously) in view of Still (US 7,166,560).

With respect to independent claim 41, Harris et al. discloses a process for disrupting filter cake in an underground formation (p. 2, l. 15-28), which process comprises: dispersing in a treatment fluid an ester capable of being converted by hydrolysis into one or more organic acids (p. 3, l. 15-28; p. 5, l. 29 - p. 6, l. 26); introducing the treatment fluid into said underground formation containing said filter cake; and allowing the ester to hydrolyze in the presence of water to produce organic acid such that acid soluble material within the filter cake or adjacent formation is dissolved (p. 3, l. 5-10).

Harris et al. teaches the formation of the treatment fluid by dispersing the above cited ester capable of producing an organic acid with a polymer breaker (p. 3, l. 5-10). The reference, however, fails to explicitly teach wherein the ester capable of being converted by hydrolysis into one or more organic acids is a solid polymer as claimed.

Still et al. teaches the dispersion of solid polymers capable of producing an organic acid under down hole conditions within a treatment fluid for the purpose of providing a material capable of hydrolyzing as a part of a suspension in a treatment fluid in the well bore, in perforations, in a fracture, or in the pores of the formation itself (col. 6, l. 61-67) in a controlled

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manner (col. 2, l. 26-27). Within the background, Still et al. teaches wherein previously known and employed methods within the art used to delay formation of acid down hole include the use of liquid esters which are known to hydrolyze in situ. Still et al., however, further notes that the use of esters as acid precursors leads to the formation of the acids very rapidly as soon as the ester contacts water (col. 2, l. 16-25), thereby forming a need for a delayed, controlled release of acids in situ (col. 2, l. 26-27).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute a solid polymer, i.e., a solid acid-precursor, as taught by Still et al. for the liquid ester acid precursor disclosed by Harris et al. in order to improve upon the acid generation technique disclosed by Harris et al. by providing for acid generation down hole in a controlled manner.

With respect to depending claims 42-46, Still et al. teaches wherein the solid polymer is a polyester, wherein the solid polymer is an aliphatic polyester, wherein the polymer is a polymer which comprises one or more compounds selected from the group as claimed, wherein the hydrolysis of the solid polymer produces lactic or glycolic acid, and wherein the solid polymer is polylactic acid or polyglycolic acid as claimed (col. 3, l. 19-37).

With respect to depending claims 47-49 and 76, Still et al. teaches wherein one or more other substances selected from the group consisting of materials, chemicals, catalysts, and enzymes are incorporated into the solid polymer by encapsulation to allow their controlled release coincident with or after acid production; wherein one or more other substances selected from the group consisting of materials, chemicals, catalysts, and enzymes are incorporated into the solid polymer by dissolution or dispersion to allow their controlled release coincident with

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acid production, and, further, wherein the said one or more other materials, chemicals, catalysts, and enzymes released from the solid polymer have functional activity for filter cake treatment or as production chemicals (col. 5, l. 53- col. 7, l. 7).

With respect to depending claims 50, Still et al. teaches wherein the solid polymer is used in a form selected from the group as claimed (col. 6, l. 9-33).

With respect to depending claim 51, Harris et al. discloses incorporating a buffer into the treatment fluid (p. 5, l. 7-27).

With respect to depending claims 52-58, Harris et al. discloses incorporating one or more polymer breakers into the treatment fluid (p. 3, l. 30 –p. 5, l. 27; p. 7, l. 25 – p. 11, l. 2), and, further wherein the polymer breaker is a hydrolase enzyme (p. 9, l. 5-10), a polysaccharide hydrolyzing enzyme (p. 8, l. 12-19), a polymer breaker which can hydrolyze starch, xanthan, cellulose, guar, scleroglucan or succinoglycan or a derivative of any one of the polymers (p. 8, l. 17-19), an oxidant, wherein the oxidant is selected from the group as claimed (p. 7, l. 28 – p. 8, l. 5; p. 8, l. 21 – p. 9, l. 3), and wherein the polymer breaker is in the form of a delayed release preparation (p. 13, l. 16-17).

With respect to depending claim 60, Harris et al. discloses wherein the treatment fluid disrupts or degrades at least a portion of the filter cake and increases the permeability of the formation (p. 2, l. 15-28; p. 14, l. 13-25).

With respect to depending claim 61, Harris et al. in view of the solid polymer as taught by Still et al., teaches wherein at least a portion of the polymer remains in the underground formation and continuously releases organic acid and a production chemical during hydrocarbon

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production or water injection until the polymer has completely hydrolyzed (col. 6, l. 28 - p. 7, l. 2; p. 14, l. 27-30).

With respect to depending claim 62, Harris et al. discloses wherein at least a portion of the polymer remains in the underground formation wherein the underground formation contains a hydrocarbon or water and wherein the process further comprises recovering hydrocarbon or water from the treated formation (p. 3, l. 12-13; p. 14, l. 29-30).

With respect to depending claim 63, Harris et al. discloses wherein the treatment fluid is introduced into the formation via a well bore which extends to the formation (p. 2, l. 15-27; p. 14, l. 4-30).

With respect to depending claims 64 and 65, Harris et al. discloses the method as provided above with respect to independent claim 41, and, further, wherein the treatment fluid is capable of breaking polymers such as xanthan, cellulose, and guar (p. 8, l. 17-19). The reference, however, fails to explicitly disclose wherein the treatment fluid comprises an acid sensitive viscosifying agent, wherein the viscosifying agent is crosslinked guar gum, and wherein the viscosity of the fluid is reduced by the acid generated by hydrolysis of the solid polymer as claimed. The Examiner hereby takes Official Notice in that it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide for a viscosifying agent, such as crosslinked guar gum, within the treatment fluid of Harris et al. in order to viscosify the fluid within those environments in which an increased viscosity is required to deliver the treatment fluid to the formation, insofar as because the use of crosslinked guar gum to viscosify fluids is well known within the art. Since Harris et al. discloses the capability of the

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treatment fluid to break polymers including guar, the viscosity of the crosslinked guar gum is capable of being reduced by the acid generated upon hydrolysis of the solid polymer as claimed.

With respect to depending claim 66, Harris et al. discloses wherein the treatment fluid further comprises calcium peroxide wherein the organic acid produced by hydrolysis, of the solid polymer in view of Still et al., leads to the generation of hydrogen peroxide (p. 5, l. 4-5).

With respect to depending claim 67, Still et al. teaches wherein the treatment fluid further comprises ammonium bifluoride and wherein the organic acid produced by hydrolysis of the solid polymer leads to the generation of hydrogen fluoride (col. 5, l. 15-51).

With respect to depending claim 77, Still et al. teaches wherein the polymer is a polymer which comprises one or more compounds selected from the group as claimed (col. 3, l. 19-37).

3. Claims 59 and 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harris et al. in view of Still et al. as applied to claim 41 above, and further in view of Harris et al. (WO 01/02698 – cited previously, '698 herein).

Harris et al. in view of Still et al. teaches the method as provided above with respect to independent claim 41 wherein Harris et al. further teaches wherein the treatment fluid comprises one or more polymer breakers and Harris et al. in view of Still et al. teaches wherein the fluid comprises one or more solid polymers. The combination, however, is silent to wherein the treatment fluid is a gravel packing fluid as claimed within depending claims 59 and 78. '698 teaches a method of treating a subterranean formation wherein the treatment fluid may comprise an ester dispersed in water that hydrolyzes to produce an organic acid to dissolve acid soluble material present within the reservoir wherein the fluid may be incorporated within a gravel packing fluid for the purpose of treatment of filter cakes following gravel packing operations by

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incorporation of suitable components into the gravel packing fluid (p. 3, l. 4-7). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the treatment fluid of Harris et al., in view of the solid polymer teaching of Still et al., as a gravel packing fluid in order to treat a filter cake following a gravel packing operation, thereby enhancing subsequent production from the gravel packed well.

### ***Response to Arguments***

4. Applicant's arguments and amendments with respect to the rejection of claim 50 under 35 USC 112 have been fully considered and are persuasive. The rejection has been withdrawn.

5. Applicant's arguments, with respect to the 35 USC 103(a) rejection(s) of claim(s) 41-46, 50-58, 60-67, 76, and 77 as being unpatentable over Harris et al. in view of Constien have been fully considered. The Examiner notes that the ester of Harris is a liquid. Therefore, the rejection as set forth in the previous action has been withdrawn. However, upon further search consideration, a new ground(s) of rejection is made under 35 USC 103(a) of claims 41-58, 60-67, 76, and 77 as unpatentable over Harris et al. in view of Still et al. in view of the teaching of Still et al. wherein solid acid precursor polymers capable of generating an organic acid by hydrolysis under down hole conditions are taught as an improvement upon the use of liquid esters employed in methods to generate an acid down hole.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela M. DiTrani whose telephone number is (571)272-2182. The examiner can normally be reached on M-F, 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on (571)272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer H Gay/  
Primary Examiner, Art Unit 3676

AD  
04/02/10